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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/587,109

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EXAMINER

TESKIN, FRED M

ART UNIT

PAPER NUMBER

1796

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/587,109	<b>Applicant(s)</b> MISERQUE ET AL.	
	<b>Examiner</b> Fred M. Teskin	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 15-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 15-30 is/are rejected.
- 7) ☒ Claim(s) 15 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 July 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____.                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____.  | 6) <input type="checkbox"/> Other: ____.                          |

The preliminary amendment of 24 July 2006 having been entered, claims 15-30 are currently pending and under examination herein.

The reference cited in the Search Report dated 28 October 2005 has been considered, but will not be listed on any patent resulting from this application because it was not provided on a separate list in compliance with 37 CFR 1.98(a)(1). In order to have the reference printed on such resulting patent, a separate listing, preferably on a PTO/SB/08A and 08B form, must be filed within the set period for reply to this Office action.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "4" (see Specification page 15, first full sentence and *cf.*, Figure 3). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim 15 is objected to because of the following informalities: (I) the letter "o" in the formula recited in subparagraph b) i) should be capitalized (*cf.*, Specification p. 5, subparagraph (1)); (II) "on" should read --one-- in subparagraph b)ii); and (III) the word -and- should be inserted after the semi-colon in the penultimate line. Appropriate correction is required.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 15-27, 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2003/0114608 (Tharappel), alone or in view of the evidence provided by Boulares et al.

Applicants' claims recite an olefin polymerization process comprising:

- a) providing a chromium-based or Ziegler Natta polymerization catalyst;
- b) contacting said catalyst with an alpha olefin in a polymerization reactor under polymerization conditions with an anti-fouling polymer having an average molecular weight greater than 1,000 daltons and having i) at least one polymer block characterized by the formula  $-(CH_2-CH_2-O)_k-$  wherein k is within the range of 1-50; and ii) at least one polymer block characterized by the formula  $-(CH_2-CH(R)-O-)_n-$  where R comprises an alkyl group having from 1-6 carbon atoms and n is within the range of 1-50; wherein said copolymer is terminated by end groups R' and R'', R' is OH or a C<sub>1</sub>-C<sub>6</sub> alkoxy group and R'' is H or a C<sub>1</sub>-C<sub>6</sub> alkyl group;
- c) recovering an olefin polymer from said reaction zone.

Tharappel discloses a process for producing polypropylene and polypropylene copolymers in a bulk loop reactor, the process generally involving injecting a metallocene catalyst and a Ziegler-Natta catalyst into the bulk loop reactor under propylene polymerization conditions (see paragraphs [0002] and [0007]). In paragraph [0040] *et seq.* and Fig. 1, specific disclosure is provided to a bulk loop reactor system suitable for propylene polymerization using one or more conventional Ziegler-Natta catalysts. It is stated (paragraph [0041]) that the reactor system includes a catalyst mixing and injection system for mixing the catalyst, co-catalyst and electron donor and metering the resulting mixture into a pre-polymerization loop reactor containing liquid propylene monomer where propylene polymer granules are formed upon contact between the catalyst/co-catalyst and the liquid propylene monomer. The propylene

polymer granules are then conveyed to the first loop reactor (see paragraph [0042]) and thereby recovered from the reaction zone within the pre-polymerization reactor.

As a modification when using a conventional Ziegler-Natta catalyst system, Tharappel proposes addition of an anti-fouling agent to prevent polymer coatings from forming within the loop reactor or in the product take-off line leading from the reactor. See paragraph [0071], where it is stated that the anti-fouling agent may be added to the propylene fed to the reactor, or may be added such that the anti-fouling agent is present in the catalyst mixing and injection system, thus reducing the risk of conduit plugging. By adding an anti-fouling agent in these manners, Tharappel effectively teaches contacting the anti-fouling agent with a Ziegler-Natta polymerization catalyst and an alpha olefin (propylene) in a polymerization reactor under polymerization conditions, but fails to specifically disclose so contacting the applicants' anti-fouling polymer. However, in discussing possible anti-fouling agents, Tharappel advises (paragraph [0073]) that ethylene oxide/propylene oxide block copolymer anti-fouling agent sold under the trade-names Synperonic or Pluronic may prevent fouling as effective as Stadis (a dinonylnaphthyl sulfonic acid based anti-fouling agent) with the additional advantages of minimal loss in catalyst activity at concentrations in the range of 2 ppm to 100 ppm.

As Synperonic is the same anti-fouling polymer used to prepare applicants' Resin D (*cf.*, Specification Figure 1), it is plausible to infer that this copolymer inherently possesses the requisite average molecular weight as well as polymer block characteristics and properties as recited in present claims 15-24. In any event, Boulares et al is cited to provide evidence that Synperonic and Pluronic are in fact block

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copolymers having oxyethylene and oxypropylene units corresponding to claim formulae i) and ii) as well as an average molecular weight ( $M_n$ ) within ranges recited in claims 15 and 18-20 (e.g.,  $M_n = 2205$ ; see Boulares at page 1240, Table 1). At the time of applicants' invention, it would have been obvious to one of ordinary skill in the art to add Synperonic or Pluronic anti-fouling agent to the propylene fed to the reactor in Tharappel or to include the same in the catalyst mixing and injection system when introducing a Ziegler-Natta catalyst system to the loop reactor therein, in the expectation of minimizing loss in catalyst activity while obtaining the desired prevention of polymer coatings forming within the reactor and product take-off line. Such addition would predictably result in contacting a species of applicants' anti-fouling polymer with a Ziegler-Natta polymerization catalyst and an alpha-olefin in the manner specified in step b) of the applicants' claimed process.

Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tharappel, alone or in view of Boulares et al as applied to claims 15-27, 29 and 30 above, and further in view of US 3248179 (Norwood).

Tharappel and Boulares et al are applied as in the preceding rejection. Though not mentioned in Tharappel, operating a polymerization reactor at a pressure within the claimed range is conventional when preparing polypropylene in a closed loop reactor using a Ziegler-Natta type catalyst, as taught by Norwood. Norwood specifically teaches (Example II) operating a closed loop reactor at 355 psig (or 24.5 bar) when preparing propylene homopolymer using a catalyst based on diethylaluminum chloride

and a  $\text{TiCl}_3$  complex. It would have been obvious to modify Tharappel by operating the loop reactor(s) therein at a comparable pressure when polymerizing propylene using the same catalyst type, and an ordinarily skilled practitioner would have expected the modification to yield nothing more than the predictable result of an equivalent reactor product at the time the invention was made.

The prior art made of record and not relied upon is considered pertinent to applicants' disclosure.

Strobbe et al is cited as pertinent to the prevention of fouling in loop reactors (note col. 2, lines 20+).

No claims are in condition for allowance at this time.

Any inquiry concerning this communication should be directed to Examiner F. M. Teskin whose telephone number is (571) 272-1116. The examiner can normally be reached on Monday through Thursday from 7:00 AM - 4:30 PM, and can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The appropriate fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.



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For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Fred M Teskin/

Primary Examiner, Art Unit 1796